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(54) **Cooling for turbine shroud segments**

(57) A segmented turbine cooling component (130), such as shroud segment (130) for the high pressure and low pressure turbine sections of a gas turbine engine, useful in providing preferential cooling to the side rails or panels (214) of the turbine component (130) through the combination of cooling air fed into the intermediate pressure cavity (424) between the discourager and primary seals (404, 412) and then through recesses (282) in the bottom wall (256) of the lower discourager seal slot (242) that impinges air on the portion (448) of the side panel (214) below the discourager seal (404). The side panels (214) of the turbine component (130) have an upper primary seal slot (246) and a lower discourager seal slot (242) with a bottom wall (258) having a plurality of alternating lands (278) and recesses (282) along the length thereof and a plurality of cooling air passages

(286) having outlets (292) exiting into the lower slot (242) above the lands (278). The subassembly (400) can be formed from a plurality of such turbine components (130) where the spacing of the lands (278) and recesses (282) of the lower discourager slots (242) of the adjacent side panels (214) are staggered such that the lands (278) of the lower slot (242) of one adjacent panel (214) are opposite the recesses (282) of the lower slot (242) of the other adjacent side panel (214). This subassembly (400) also has primary and discourager seals (412, 404) received by the respective upper and lower slots (246, 242) that are positioned in the gap (402) between the adjacent panels (214) which define the intermediate pressure cavity (424) therebetween and the trench (420) below the discourager seal (404) that is purged by spent cooling air (446) from the recesses (282) in the lower slot (242).

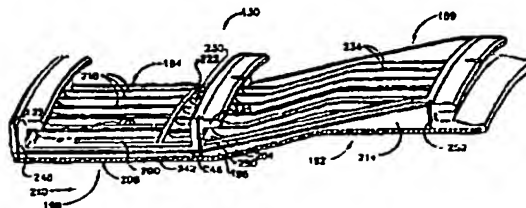


FIG. 2

EP 1 162 346 A3

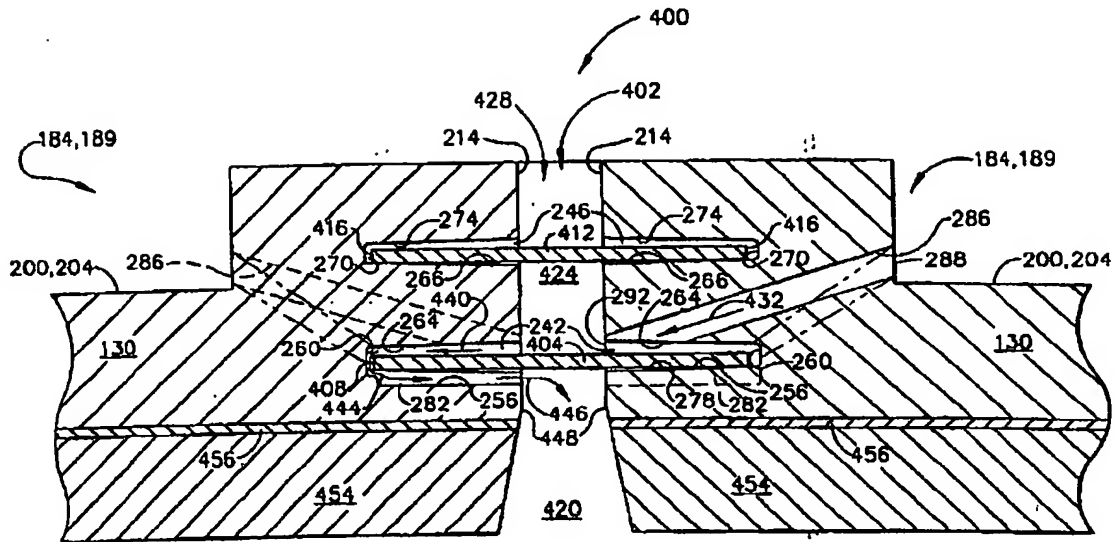


FIG. 10

EP 1 162 346 A3

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EUROPEAN SEARCH REPORT

Application Number
EP 01 30 3095

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
Y	US 5 088 888 A (BOBO MELVIN) 18 February 1992 (1992-02-18) * figures *	1,2	F01D25/24 F01D11/00
Y	US 5 167 485 A (STARKWEATHER JOHN H) 1 December 1992 (1992-12-01) * figures *	1,2	
D,A	US 5 127 793 A (ELOVIC ANDREW P ET AL) 7 July 1992 (1992-07-07)		
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			F01D F02C
The present search report has been drawn up for all claims			
Place of search MUNICH		Date of completion of the search 18 November 2003	Examiner Raspo, F
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EP 1 162 346 A3

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ON EUROPEAN PATENT APPLICATION NO.

EP 01 30 3095

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18-11-2003

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5088888 A	18-02-1992	NONE	
US 5167485 A	01-12-1992	CA 2024721 A1	09-07-1991
		DE 4027812 A1	11-07-1991
		FR 2656899 A1	12-07-1991
		GB 2239679 A	10-07-1991
		JP 3213602 A	19-09-1991
US 5127793 A	07-07-1992	CA 2039821 A1	01-12-1991
		DE 4101872 A1	05-12-1991
		FR 2662746 A1	06-12-1991
		GB 2244523 A ,B	04-12-1991
		IL 96975 A	15-03-1993
		JP 4330302 A	18-11-1992

EPO FORM P01A

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